

TABLE 3.—Solar-radiation measurements, and determinations of atmospheric turbidity factor, β , Washington, D.C., March 1933

Date and solar hour angle	Solar altitude, h	Air mass, m	I_0 cal.	I_1 cal.	I_2 cal.	β	Blue-ness of sky	Atmospheric dust particles per cubic centimeter	Notes: Sky-light polarization, P, clouds, etc.
1933									
Mar. 6									
3:54 a.	20-01	2.90	1.225	0.877	0.758	0.040		914	
3:48 a.	21-03	2.77	1.244	.888	.744	.040			
3:44 a.	21-45	2.69	1.269	.934	.756	.038			
3:40 a.	22-26	2.61	1.280	.936	.759	.035			
2:46 a.	31-16	1.92	1.285	.880	.735	.060	5		P=51.2 %
2:42 a.	31-20	1.92	1.257	.880	.755	.070			Cirri.
Mar. 9									
4:18 a.	16-34	3.48	1.079	.791	.665	.042		275	
4:12 a.	17-34	3.28	1.105	.797	.667	.040			
3:35 a.	24-10	2.43	1.217	.881	.707	.045			
3:29 a.	25-10	2.34	1.250	.879	.712	.040			
2:40 a.	32-54	1.84	1.340	.918	.746	.045	5		P=48.2 %
2:37 a.	33-29	1.81	1.360	.921	.747	.045			
1:27 a.	42-08	1.49	1.444	.921	.735	.040			
1:20 a.	42-47	1.47	1.463	.922	.755	.035			
Mar. 27									
4:51 a.	15-00	3.82	.645	.488	.447	.130		899	
4:48 a.	15-36	3.68	.644	.491	.460	.135			
4:27 a.	19-40	2.95	.753	.569	.516	.165			Cirri.
4:22 a.	20-35	2.82	.787	.571	.521	.165			
3:51 a.	26-34	2.23	.816	.635	.537	.180			P=42.6 %
3:47 a.	27-18	2.17	.832	.638	.540	.180	4		
Mar. 29									
4:57 a.	14-24	3.98	.909	.688	.591	.065		317	
4:54 a.	14-58	3.84	.922	.691	.596	.065			
4:33 a.	19-02	3.05	1.029	.765	.647	.075			
4:28 a.	19-56	2.92	1.058	.769	.650	.065			
4:20 a.	21-36	2.70	1.075	.794	.671	.078			
4:16 a.	22-12	2.63	1.106	.797	.672	.072			
3:51 a.	26-51	2.21	1.211	.853	.700	.060			P=53.7 %
3:47 a.	27-35	2.15	1.236	.856	.700	.052	6		
2:13 a.	43-22	1.46	1.353	.888	.700	.105			
2:09 a.	43-56	1.44	1.338	.891	.700	.115			
0:55 a.	52-20	1.27	1.424	.935	.759	.068			
0:51 a.	52-40	1.26	1.429	.938	.759	.068			
1:36 p.	48-19	1.34	1.350	.950	.774	.110			
1:42 p.	47-36	1.36	1.306	.863	.771	.140			
2:43 p.	38-42	1.60	1.295	.884	.694	.140			
2:47 p.	37-40	1.63	1.301	.887	.694	.140			
3:26 p.	31-14	1.93	1.218	.860	.694	.135			
3:30 p.	30-42	1.95	1.221	.863	.697	.135			

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Perkins, and Mount Wilson Observatories. The differences of longitude are measured from central meridian, positive west. The north latitude are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longi- tude	Lat- tude	Spot	Group	
1933							
	<i>h. m.</i>	<i>°</i>	<i>°</i>	<i>°</i>			
Mar. 1 (Naval Observatory) -----	11 56	-64.0	305.4	+13.0		123	123
Mar. 2 (Mount Wilson)-----	12 0	-51.0	305.2	+14.0		223	
		-23.0	333.2	+9.0	11		234
Mar. 3 (Naval Observatory) -----	11 34	-37.0	306.3	+13.0		93	93
Mar. 4 (Naval Observatory) -----	11 35	-24.0	306.1	+13.0		93	93
Mar. 5 (Perkins Observatory) -----	16 0	-13.5	301.0	+13.0		90	
		-4.5	310.0	+16.5		90	180
Mar. 6 (Naval Observatory) -----	11 9	+3.0	307.0	+13.0		93	93
Mar. 7 (Mount Wilson) -----	12 35	+16.0	306.0	+14.0		118	118

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longi-tude	Lat-i-tude	Spot	Group	
Mar. 8 (Naval Observatory).....	h. m.	°	°	°			
	11 51	+24.0	301.2	+11.0	-----	9	-----
		+33.0	310.2	+15.0	-----	77	86
Mar. 9 (Naval Observatory).....	10 5	+37.0	302.0	+11.0	-----	9	-----
		+46.0	311.0	+15.0	-----	77	86
		+60.0	311.3	+15.0	-----	77	77
		+74.0	311.7	+15.0	-----	77	77
Mar. 10 (Naval Observatory).....	11 8	No spots					
Mar. 11 (Naval Observatory).....	11 49	No spots					
Mar. 12 (Perkins Observatory).....	14 0	No spots					
Mar. 13 (Mount Wilson).....	11 30	No spots					
Mar. 14 (Mount Wilson).....	12 25	No spots					
Mar. 15 (Naval Observatory).....	10 58	No spots					
Mar. 16 (Naval Observatory).....	11 35	No spots					
Mar. 17 (Naval Observatory).....	11 44	No spots					
Mar. 18 (Mount Wilson).....	11 0	No spots					
Mar. 19 (Mount Wilson).....	10 50	No spots					
Mar. 20 (Mount Wilson).....	10 45	No spots					
Mar. 21 (Mount Wilson).....	11 0	No spots					
Mar. 22 (Naval Observatory).....	13 28	-73.0	18.8	+4.0	-----	401	401
Mar. 23 (Mount Wilson).....	11 45	-58.0	21.5	+5.0	-----	408	408
Mar. 24 (Naval Observatory).....	13 44	-45.0	20.3	+4.0	-----	216	216
Mar. 25 (Mount Wilson).....	11 30	-32.0	21.3	+5.0	-----	234	-----
		+20.0	73.3	+10.0	-----	31	265
Mar. 26 (Naval Observatory).....	12 44	-18.0	21.5	+4.0	-----	247	-----
		+35.0	74.5	+10.0	-----	77	324
Mar. 27 (Mount Wilson).....	11 15	-5.0	22.1	+5.0	-----	200	-----
		+49.0	76.1	+10.0	-----	44	244
Mar. 28 (Naval Observatory).....	11 20	+8.0	21.9	+5.0	-----	185	-----
		+62.0	75.9	+10.0	-----	93	278
Mar. 29 (Naval Observatory).....	10 54	+22.0	22.9	+5.0	-----	170	170
Mar. 30 (Naval Observatory).....	11 13	+36.0	23.5	+5.0	-----	123	123
Mar. 31 (Mount Wilson).....	11 10	+49.0	23.3	+4.0	-----	131	131
Mean daily area for March.....							123

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PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MARCH 1933

[Dependent alone on observations at Zurich and its station at Arosa]

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

March 1933	Relative numbers	March 1933	Relative numbers	March 1933	Relative numbers
1-----	10	11-----	7	21-----	0
2-----	10	12-----	7	22-----	d12
3-----	10	13-----	0	23-----	14
4-----	13	14-----	0	24-----	14
5-----	11	15-----	0	25-----	Mc24
6-----	a11	16-----	0	26-----	29
7-----	11	17-----	0	27-----	26
8-----	-----	18-----	0	28-----	a28
9-----	9	19-----	0	29-----	22
10-----	8	20-----	0	30-----	d12
				31-----	10

Mean: 30 days=10.0.

a= Passage of an average-sized group through the central meridian.
b= Passage of a large group or spot through the central meridian.
c= New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.
d= Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, W. R. Gregg, in charge]

By L. T. SAMUELS

Free-air temperatures during March were above normal at all stations except Chicago and Cleveland. (See table 1.) The departures were only of moderate magnitude. Free-air relative humidities averaged above nor-

mal with departures of small to moderate magnitude in most cases.

There were no important deviations in the monthly resultant winds as compared to the normals.